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Neuropathy, the foot and the brain

Abstract: OP-0605

Corneal nerve fibre length is reduced in diabetic individuals who develop 3-year incident diabetic neuropathy

N. Pritchard Pritchard[1], K. Edwards Edwards[1], S. Srinivasan Srinivasan[1], C. Dehghani Dehghani[1], D. Vagenas Vagenas[1], A. Russell Russell[2], R. Malik Malik[3], N. Efron Efron[1]

[1]Queensland University of Technology, Institute of Health and Biomedical Innovation, Brisbane, Australia

[2]Princess Alexandra Hospital and University of Queensland, School of Medicine, Brisbane, Australia

[3]University of Manchester and Central Manchester Foundation Trust, Division of Cardiovascular Medicine, Manchester, United Kingdom

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Aims:
Depletion of corneal nerves has been investigated as a potential marker and/or predictor of neuropathy. To determine the clinical measures that predict 3-year incidence of diabetic neuropathy, baseline clinical parameters of individuals with type 1 diabetes who developed neuropathy were compared to those who did not develop neuropathy over a 3-year period.

Methods:
Sixty-four participants with diabetes, but without baseline neuropathy in the LANDMark Study Cohort have completed 3 years of longitudinal follow-up. The baseline characteristics of those who developed neuropathy were compared to those that did not. Neuropathy was defined, by the Toronto criteria, as abnormal nerve conduction, and a sign (neuropathy disability score ≥ 3) or symptom (diabetic neuropathy symptom score ≥ 1) of neuropathy.

Results:
Diabetic neuropathy developed in 7 (11%) participants over a mean follow-up of 3.0 (range 2.9 to 3.2) years. Baseline corneal nerve fibre length (CNFL) was significantly lower in individuals who developed neuropathy over 3 years (13.3 ± 3.7 mm/mm2) compared to those that did not (17.4 ± 5.0 mm/mm2)(P =0.036). Reduced peroneal CV (40.6 ± 4.1 vs. 46.7 ± 4.6, p=0.003), and cold sensation (23.5 ± 5.9 vs. 27.2 ± 5.0, p=0.022) and increased vibration threshold (20.5 ± 14.4 vs. 11.9 ± 17.6, p=0.034) were also associated with development of diabetic neuropathy. The odds ratio of having reduced CNFL in those who developed neuropathy vs. those who did not develop neuropathy was 0.871 (95% CI 0.825-0.920) compared to peroneal CV 0.953 (95% CI 0.936-0.970), cold sensation 0.921 (95% CI 0.892-0.950) and vibration thresholds 0.936 (95% CI 0.891-0.982).

Conclusion:
Corneal confocal microscopy examination may be an appropriate adjunct to diabetic neuropathy screening in a clinical setting. Non-invasive corneal evaluation as part of routine eye examination may assist in early detection of peripheral neuropathy and be a useful test in predicting individuals who develop neuropathy.

No conflict of interest